Listing of Claims:

This listing of claims replaces all previously listings of claims.

1. (Currently amended) An overlay control system comprising:

a plurality of process machines;

a data collection tool wherein said data collection tool measures overlay error from a run of a lot through a process machine and generates overlay error measurement data;

a data processing tool for processing said overlay error measurement data, said processing including generating an overlay control table wherein said overlay control table comprises current layer overlay correction value, C_n, previous layer overlay correction value, P_n, overlay measurement error value, O_n, residual overlay error value, R_n, fine tuning value, F_n, and average process offset value, K for a lot n, wherein the data processing tool sends the overlay control table to an operator for use in manual overlay correction or to a smart overlay control servo for use in automatic overlay correction;

~~an overlay tool servo wherein said overlay tool servo processes overlay error data, sends said overlay error data to an operator for use in manual overlay correction, and sends said overlay error data to a smart overlay control servo for use in automatic overlay correction;~~

~~said smart overlay control servo wherein said smart overlay control servo generates an overlay control table for each lot type;~~ and

an in-line equipment servo wherein said in-line equipment servo obtains previous layer correction and fine tuning values from said smart overlay control servo for a lot on a process machine, calculates an overlay correction using said previous layer overlay correction and said fine tuning values, and sends said overlay correction to said process machine, [[.]]

wherein for said lot n, the overlay control table is generated using the following algorithm:

	$C_n = P_n + F_{n-1}$	O_n	R_n	F_n
n=1	$C_1 = P_1 + K$	O_1	$R_1 = K - O_1$	$F_1 = R_1$
n=2	$C_2 = P_2 + F_1$	O_2	$R_2 = F_1 - O_2$	$F_2 = 1/2 * (R_1 + R_2)$
n=3	$C_3 = P_3 + F_2$	O_3	$R_3 = F_2 - O_3$	$F_3 = 1/3 * (R_1 + R_2 + R_3)$
n=4	$C_4 = P_4 + F_3$	O_4	$R_4 = F_3 - O_4$	$F_4 = 1/3 * (R_2 + R_3 + R_4)$
n=5	$C_5 = P_5 + F_4$	O_5	$R_5 = F_4 - O_5$	$F_5 = 1/3 * (R_3 + R_4 + R_5)$
n=6	$C_6 = P_6 + F_5$	O_6	$R_6 = F_5 - O_6$	$F_6 = 1/3 * (R_4 + R_5 + R_6)$
n=k	$C_k = P_k + F_{k-1}$	O_k	$R_k = F_{k-1} - O_k$	$F_k = 1/3 * (R_{k-2} + R_{k-1} + R_k)$
n=k+1	$C_{k+1} = P_{k+1} + F_k$	O_{k+1}	$R_{k+1} = F_k - O_{k+1}$	$F_{k+1} = 1/3 * (R_{k-1} + R_k + R_{k+1})$

wherein said variables C_n, P_n, O_n, R_n, F_n, and K are defined as above and $P_1 = 0$ and K value is supplied with initial data for n=1.

2. (Original) The system according to Claim 1 wherein said overlay correction for a lot's current layer on said process tool is equal to an overlay correction for said lot's previous layer on said process tool plus fine tuning wherein said fine tuning is equal to a running average of previous lots' overlay errors.

3. (Currently amended) The system ~~method~~ according to Claim 1 wherein said overlay control table encompasses a given technology, a particular layer, and a particular process tool combination.

4. (Currently amended) The system according to Claim 1 wherein said overlay control system is used with a single alignment mark system.

5. (Currently amended) The system according to Claim 2 wherein said overlay control system is used with a multiple alignment mark system and wherein said overlay correction for said lot's previous layer on said process tool is set to zero.

6. (Currently amended) A method of overlay control comprising:

automatically generating an overlay control table for lots run through a process tool, wherein for a lot n, said overlay control table is generated using the following algorithm:

	$C_n = P_n + F_{n-1}$	O_n	R_n	F_n
n=1	$C_1 = P_1 + K$	O_1	$R_1 = K - O_1$	$F_1 = R_1$
n=2	$C_2 = P_2 + F_1$	O_2	$R_2 = F_1 - O_2$	$F_2 = 1/2 * (R_1 + R_2)$
n=3	$C_3 = P_3 + F_2$	O_3	$R_3 = F_2 - O_3$	$F_3 = 1/3 * (R_1 + R_2 + R_3)$
n=4	$C_4 = P_4 + F_3$	O_4	$R_4 = F_3 - O_4$	$F_4 = 1/3 * (R_2 + R_3 + R_4)$
n=5	$C_5 = P_5 + F_4$	O_5	$R_5 = F_4 - O_5$	$F_5 = 1/3 * (R_3 + R_4 + R_5)$
n=6	$C_6 = P_6 + F_5$	O_6	$R_6 = F_5 - O_6$	$F_6 = 1/3 * (R_4 + R_5 + R_6)$
n=k	$C_k = P_k + F_{k-1}$	O_k	$R_k = F_{k-1} - O_k$	$F_k = 1/3 * (R_{k-2} + R_{k-1} + R_k)$
n=k+1	$C_{k+1} = P_{k+1} + F_k$	O_{k+1}	$R_{k+1} = F_k - O_{k+1}$	$F_{k+1} = 1/3 * (R_{k-1} + R_k + R_{k+1})$

wherein C_n is current layer overlay correction value, P_n is previous layer overlay correction value where $P_1=0$, O_n is overlay measurement error value, R_n is residual overlay error value, F_n is fine tuning value, and K is average process offset value where K is supplied with initial data for n=1; and

sending an overlay correction calculated from said overlay control table to an in-line equipment servo for automatic overlay correction of said process tool in real-time.

7. (Original) The method according to Claim 6 wherein said overlay correction for a lot's current layer on said process tool is equal to an overlay correction for said lot's previous layer on said process tool plus fine tuning wherein said fine tuning is equal to a running average of previous lots' overlay errors.

8. (Original) The method according to Claim 6 wherein said overlay control table encompasses a given technology, a particular layer, and a particular process tool combination.

9. (Original) The method according to Claim 6 wherein said overlay control is used with a single alignment mark system.

10. (Original) The method according to Claim 7 wherein said overlay control is used with a multiple alignment mark system and wherein said overlay correction for said lot's previous layer on said process tool is set to zero.

11. (Currently amended) A method of overlay control comprising:

automatically generating an overlay control table for lots run through a process tool, wherein for a lot n, said overlay control table is generated using the following algorithm:

$C_n = P_n + F_{n-1} \quad O_n \quad R_n \quad F_n$

n=1	$C_1 = P_1 + K$	O_1	$R_1 = K - O_1$	$F_1 = R_1$
n=2	$C_2 = P_2 + F_1$	O_2	$R_2 = F_1 - O_2$	$F_2 = 1/2 * (R_1 + R_2)$
n=3	$C_3 = P_3 + F_2$	O_3	$R_3 = F_2 - O_3$	$F_3 = 1/3 * (R_1 + R_2 + R_3)$
n=4	$C_4 = P_4 + F_3$	O_4	$R_4 = F_3 - O_4$	$F_4 = 1/3 * (R_2 + R_3 + R_4)$
n=5	$C_5 = P_5 + F_4$	O_5	$R_5 = F_4 - O_5$	$F_5 = 1/3 * (R_3 + R_4 + R_5)$
n=6	$C_6 = P_6 + F_5$	O_6	$R_6 = F_5 - O_6$	$F_6 = 1/3 * (R_4 + R_5 + R_6)$
n=k	$C_k = P_k + F_{k-1}$	O_k	$R_k = F_{k-1} - O_k$	$F_k = 1/3 * (R_{k-2} + R_{k-1} + R_k)$
n=k+1	$C_{k+1} = P_{k+1} + F_k$	O_{k+1}	$R_{k+1} = F_k - O_{k+1}$	$F_{k+1} = 1/3 * (R_{k-1} + R_k + R_{k+1})$

wherein C_n is current layer overlay correction value, P_n is previous layer overlay correction value where $P_1=0$, O_n is overlay measurement error value, R_n is residual overlay error value, F_n is fine tuning value, and K is average process offset value where K is supplied with initial data for n=1; and

sending an overlay correction calculated from said overlay control table to a lot. information servo for manual overlay correction of said process tool ~~be used in a manual or real-time overlay correction process~~.

12. (Original) The method according to Claim 11 wherein said overlay correction for a lot's current layer on said process tool is equal to an overlay correction for said lot's previous layer on said process tool plus fine tuning wherein said fine tuning is equal to a running average of previous lots' overlay errors.

13. (Original) The method according to Claim 11 wherein said overlay control table encompasses a given technology, a particular layer, and a particular process tool combination.

14. (Original) The method according to Claim 11 wherein said overlay control is used with a single alignment mark system.

15. (Original) The method according to Claim 12 wherein said overlay control is used with a multiple alignment mark system and wherein said overlay correction for said lot's previous layer on said process tool is set to zero.

16. – 20. (Canceled)

21. (New) The overlay control system of claim 1, wherein said data processing tool comprises:

an overlay tool servo; and

a lot information servo, wherein said overlay tool servo generates the overlay control table.

22. (New) The overlay control system of claim 1, wherein said process machines are exposure tools.

23. (New) The method of claim 6, wherein said process tool is an exposure tool.

24. (New) The method of claim 11, wherein said process tool is an exposure tool.